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## CHALLENGING ANALYTICAL TASK: ANALYSIS AND MONITORING OF ARSENIC SPECIES IN WATER

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### Abstract

Analysis and monitoring of arsenic is still a challenging analytical task. Due to its complex behaviour (different forms of arsenic that can be present depending on pH and oxidation states of arsenic) as well as demanding analytical procedures and instrumental tools for control of arsenic concentration in drinking water which is set to  $10 \mu\text{g L}^{-1}$ , there are still some open questions and issues when arsenic is the scientific topic. In this paper the idea was to use a multivariate statistical approach to identify the key variables and their relation to high arsenic concentration in surface waters of Serbia. The main idea was to identify and connect the key water quality parameters with arsenic concentration and to suggest adequate treatment technologies for water purification and arsenic removal. The data set for multivariate statistical approach were water quality parameters of surface water samples from Serbia. The artificial neural network (ANN) was applied for data analysis. After applying ANN the results showed strong relation between arsenic concentration and  $P_{\text{tot}}$ ,  $\text{SO}_4^{2-}$ , COD, carbonate,  $N_{\text{org}}$ , DO, and  $\text{SiO}_2$  content. What could be concluded from the obtained results is that high concentration of organic matter, proportional to nutrients (nitrogen and phosphorus), silica ( $\text{SiO}_2$ ) and dissolved oxygen highly correlates with the dissolved arsenic which implies that the most adequate technology for the water treatment could be precipitation, which in general includes coagulation. What remains unquestioned and needs to be performed is arsenic speciation analysis.

*Key words:* arsenic, multivariate statistical approach, surface water quality

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